CLAIMS

What is claimed is:

1. A medium category determination method comprising the steps of:

scanning an unknown medium to obtain a luminance value of red, a luminance value of green and a luminance value of blue;

calculating the corresponding standard deviations of said luminance values of the unknown medium; and

applying an algorithm on the luminance values and the standard deviations of the unknown medium, and on a plurality of luminance samples and corresponding standard deviation samples from a plurality of known media, to determine the category of the unknown medium as the category of one of the known media.

2. The method according to claim 1, wherein the algorithm determines the category of the unknown medium as the category of the known medium with the smallest C_i, which is defined as $C_i=w_r*d_{ri}+w_g*d_{gi}+w_b*w_{bi}$, where

i: the identification of the known medium;

w_r: the weighting of red;

w_g: the weighting of green;

w_b: the weighting of blue;

d_{ri}: the distance between the coordinates of red of the unknown medium and the i-th known medium in a luminance-standard deviation coordinate system;

d_{gi}: the distance between the coordinates of green of the unknown medium and the i-th known medium in the luminance-standard deviation coordinate system; and

d_{bi}: the distance between the coordinates of blue of the unknown medium and the i-th known medium in the luminance-standard deviation coordinate system.

3. The method according to claim 2, wherein the luminance samples and the standard deviation samples are provided by the steps of:

scanning a plurality of blocks on the known medium to obtain a plurality of test luminance values of red, green and blue;

calculating the test standard deviations of the test luminance values of the known medium;

calculating the coordinates of the gravity centers of the test luminance values and the test standard deviations of red, green and blue in the luminance-standard deviation coordinate system, and taking the coordinates of the gravity centers as the representatives of the known medium.

4. The method according to claim 2, which is executed by a medium category determination module comprising:

a database storing the luminance samples and the standard deviation samples of the known media;

a detection unit controlling a scan module to scan the unknown medium to obtain the luminance values of red, green and blue;

an arithmetic unit which receives the luminance values of the unknown medium from the detection unit, calculates the corresponding standard deviations, retrieves the luminance samples and the standard deviation samples from the database, and calculates the C_is for the known medium according the algorithm; and

a determination unit determining the category of the unknown medium as the category of one of the known media with the smallest C_i.

5. The method according to claim 4, wherein the medium category determination module further comprises a configuration unit to generate a user interface for users to determine the categories of the unknown media.

6. The method according to claim 5, wherein the configuration unit enables users to change the weightings of the algorithm.

7. The method according to claim 5, wherein the configuration unit further provides a

luminance-standard deviation diagram to show the distribution of (luminance value, standard deviation) points of the known media and the unknown medium.

8. The method according to claim 1, wherein the known media are selected from the group consisting of plain paper, photo-paper, coated-paper and transparency.

9. The method according to claim 1, wherein the scan of the unknown medium is done by a scan module.

10. The method according to claim 9, wherein the scan module is a charge-coupled device (CCD) or a contact image sensor (CIS).

11. A medium category determination method comprising the steps of:

scanning an unknown medium to obtain a luminance value of red, a luminance value of green and a luminance value of blue;

calculating the corresponding standard deviations of said luminance values of the unknown medium; and

applying an algorithm on the luminance values and the standard deviations of the unknown medium, and on a plurality of luminance samples and corresponding standard deviation samples from a plurality of known media to determine the category of the unknown medium as the category of one of the known media;

wherein the algorithm determines the category of the unknown medium as the category of the known medium with the smallest C_i, which is defined as $C_i=w_r*d_{ri}+w_g*d_{gi}+w_b*w_{bi}$, where

i: the identification of the known medium;

w_r: the weighting of red;

w_g: the weighting of green;

w_b: the weighting of blue;

d_{ri}: the distance between the coordinates of red of the unknown medium and the i-th known medium in a luminance-standard deviation coordinate system;

d_{gi}: the distance between the coordinates of green of the unknown medium and the i-th known medium in the luminance-standard deviation coordinate system; and

d_{bi}: the distance between the coordinates of blue of the unknown medium and the i-th known medium in the luminance-standard deviation coordinate system.

12. The method according to claim 11, wherein the luminance samples and the standard deviation samples are provided by the steps of:

scanning a plurality of blocks on the known medium to obtain a plurality of test luminance values of red, green and blue;

calculating the test standard deviations of the test luminance values of the known medium;

calculating the coordinates of the gravity centers of the test luminance values and the test standard deviations of red, green and blue in the luminance-standard deviation coordinate system, and taking the coordinates of the gravity centers as the representatives of the known medium.

13. The method according to claim 11, wherein the method is executed by a medium category determination module, which comprises:

a database storing the luminance samples and the standard deviation samples of the known media;

a detection unit controlling a scan module to scan the unknown medium to obtain the luminance values of red, green and blue;

an arithmetic unit which receives the luminance values of the unknown medium from the detection unit, calculates the corresponding standard deviations, retrieves the luminance samples and the standard deviation samples from the database, and calculates the C_is for the known medium according the algorithm; and

a determination unit determining the category of the unknown medium as the category of one of the known media with the smallest C_i.

14. The method according to claim 13, wherein the medium category determination module further comprises a configuration unit to generate a user interface for user to determine the category of the

unknown medium.

15. The method according to claim 14, wherein the configuration unit enables users to change the weightings of the algorithm.

16. The method according to claim 14, wherein the configuration unit provides a luminance-standard deviation diagram to show the distribution of the (luminance value, standard deviation) points of the known media and the unknown medium.

17. The method according to claim 11, wherein the known media are selected from the group consisting of plain paper, photo-paper, coated-paper and transparency.

18. The method according to claim 11, wherein the unknown medium is scanned by a scan module.

19. The method according to claim 18, wherein the scan module is a charge-coupled device (CCD) or a contact image sensor (CIS).

20. The method according to claim 18, wherein the scan module is placed in a MFP.